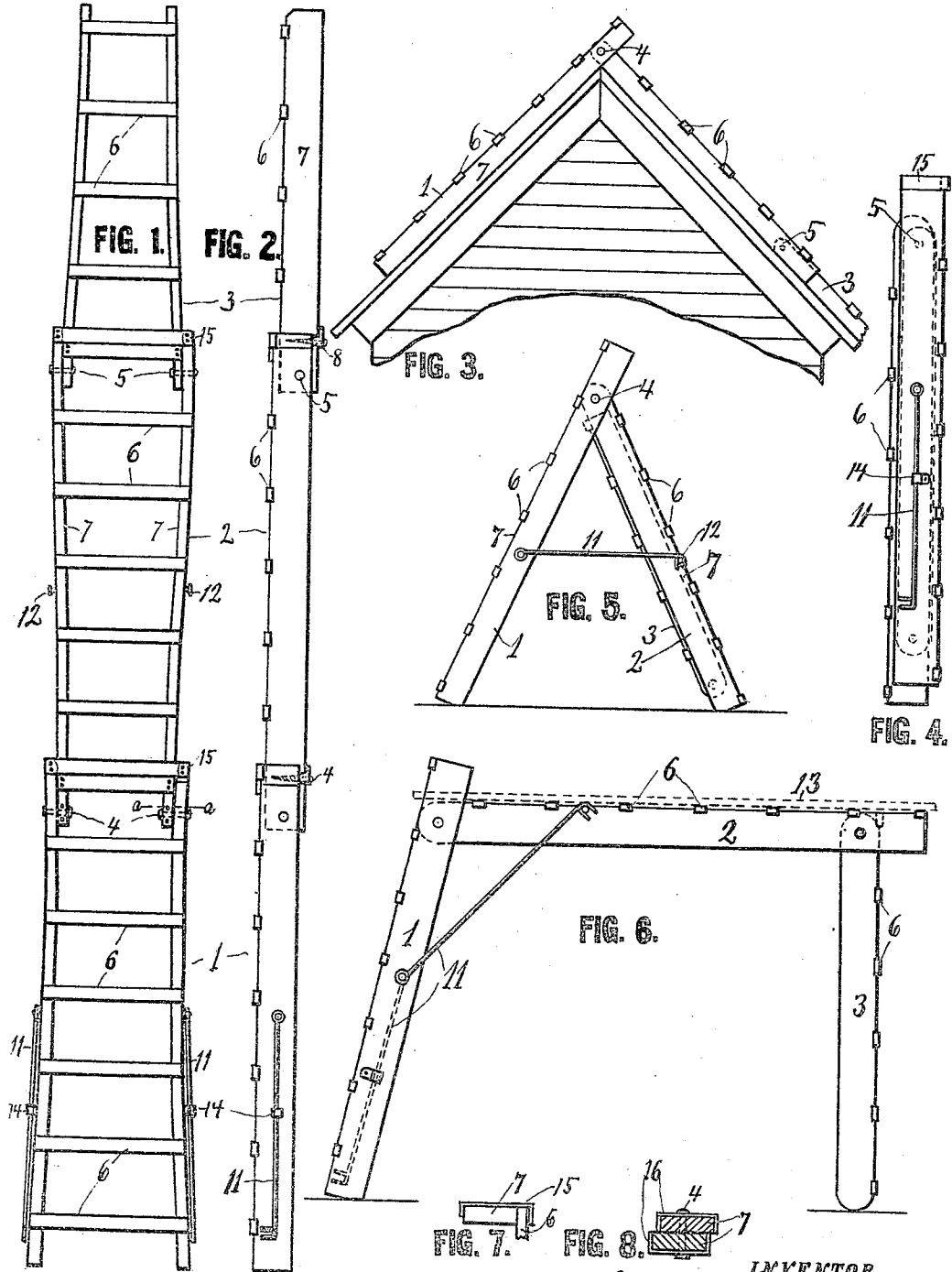


O. E. LINDFORS.
FOLDING LADDER.

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WITNESSES:

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UNITED STATES PATENT OFFICE.

OLAF E. LINDFORS, OF FRUITA, COLORADO.

FOLDING LADDER.

No. 801,388.

Specification of Letters Patent.

Patented Oct. 10, 1905.

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To all whom it may concern:

Be it known that I, OLAF E. LINDFORS, a subject of the King of Sweden and Norway, who have declared my intention to become a citizen of the United States, residing at Fruita, in the county of Mesa and State of Colorado, have invented certain new and useful Improvements in Folding Ladders; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to folding ladders, and has for its object the providing of a very useful and handy folding ladder which may be converted into an extension-ladder, a step-ladder, roof-ladder, and trestle or scaffold for the use of painters, paper-hangers, and carpenters. This object I attain by the novel construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of the complete ladder in extended or unfolded position. Fig. 2 is a side view of Fig. 1. Fig. 3 is the roof portion of a house with the ladder in use upon the roof. Fig. 4 is a side view of the ladder fully folded for transportation or storing. Fig. 5 is a side view of the ladder used as a step-ladder. Fig. 6 is a side elevation showing the ladder used as a trestle. Fig. 7 is a top view of one of the rails of either the middle section or lower section of the ladder and a portion of the top step. Fig. 8 is a sectional view looking downward at the line *a a* in Fig. 1.

Referring to the drawings by reference-numerals, it will be seen that the ladder is made up of three sections 1, 2, and 3, of which the lowest one is the widest, the middle one narrower, and the top section narrowest, so that when the sections are pivoted together at 4 and 5 they may fold into each other, as shown in Fig. 4, since the steps or rungs 6 are all secured upon or into the front edges of the flat side rails 7.

The two upper sections are each pivoted to the adjacent lower section so far below its upper end that the rails find support against the top rung of the section below, and the sections may be locked in that unfolded position by the latches 8, pivoted near the top of each of the two lower sections, or any other

suitable form of catches may be used so as to prevent accidental folding of the ladder. This applies mainly to large ladders. In small ones the friction in the joints of the sections, which are for that purpose made to work very snugly, suffice to prevent accidental folding.

The lower section is provided upon its outer sides with two brace-hooks 11, each adapted to engage in a staple or pin 12 in the middle section, and thus brace the three sections in the position shown in Fig. 6, so that a board may be placed like the dotted lines 13 upon the ladder and serve as a scaffold, or two ladders may be thus used as trestles to support the ends of planks used for scaffolds. When the brace-hook 11 is not in use, it is folded away and held by a spring-clasp 14, secured on the rail.

To prevent each of the upper sections from forcing loose the top step of the next section below, said top steps are secured in an extra strong manner by securing a staple-shaped metallic plate 15 (see Fig. 7) over the rail 7 and the end of step 6. Similar plates 16 are used to prevent splitting of the rails 7 at the point the pivot passes through them, as best shown in Fig. 8.

It will be observed that the rails of each section are sprung inward at the middle, so as to stiffen them, and are spread toward the lower end of the lower and upper sections, while the middle section is widest at its upper end, so that when the two lower sections are formed into a step-ladder, as in Fig. 5, in which position they are held by the hooks 11, the ladder is steadied by having two of its widest ends on the ground or floor.

In Fig. 3 is clearly indicated how two or all three sections of the ladder may be used on a roof.

In Fig. 6 is shown how a board 13 may be used instead of a heavy plank, supported only at its ends in the ordinary ladders. Not only may thus a board resting on the middle section be very thin and light to handle, but also the ladder may be made very light, since the curved or sprung form of its rails lend much stiffness to it.

The brace-hooks 11 may be one or two in number, and they may be of common shape and hooked into a common staple, which need not be here described; but in order to get the staple beyond the overlapping sides of the rails when the sections are folded I prefer to make the staple a single peg and give the free

hook a gap adapted to be dropped upon the
peg.

What I claim is—

5 1. A folding ladder comprising several sections pivoted together and having the steps
or rungs disposed toward the front side of the
rails and each section diminished in width so
as to fold one within the other, and means for
holding each section substantially in line with
10 the next section when unfolded, the rails of
said sections being spread at the bottom end
of the lowest section, at the top end of the
second section and so on alternately in each
section higher up.

15 2. A folding ladder comprising several sections pivoted together and having the steps

or rungs disposed toward the front side of the
rails and each section diminished in width so
as to fold one within the other, and means for
holding each section substantially in line with 20
the next section when unfolded, the rails of
said sections being spread at the bottom end
of the lowest section, at the top end of the
second section and so on alternately in each
section higher up, said rails being also sprung 25
inward at the middle for the purpose set forth.

In testimony whereof I affix my signature in
presence of two witnesses.

OLAF E. LINDFORS.

Witnesses:

SAMUEL BARRELL,
C. H. BARNES.